Country food profiles for the Inuvialuit Settlement Region

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Introduction

The Country Foods for Good Health (CFGH) project was developed based on feedback and recommendations from local, regional and territorial stakeholders in the Inuvialuit Settlement Region (ISR) and the research gaps identified in the ISR's 2016 Beluga Summit.

The CFGH Project aims to promote healthy foods that reflect Inuvialuit culture, knowledge, and values in the ISR. It combines Western science (food sampling and analysis) with traditional knowledge to answer questions about store-bought and country foods. Phase One of the CFGH project (2018-2022) took place in the coastal communities of Paulatuk and Tuktoyaktuk. In Phase Two (2022-2024), the project expanded into the Mackenzie Delta Region (Aklavik and Inuvik) and the high Arctic (Ulukhaktok and Sachs Harbour). Country food sampling can be used to create nutrient profiles for different foods, improve risk-benefit analysis surrounding country food consumption, and ultimately help inform the creation of region-specific dietary messages to support a healthy diet in the ISR.

Objectives

1. Determine the current concentrations of nutrients and contaminants in Inuvialuit country foods
2. Co-develop communication materials to support a healthy and feasible diet
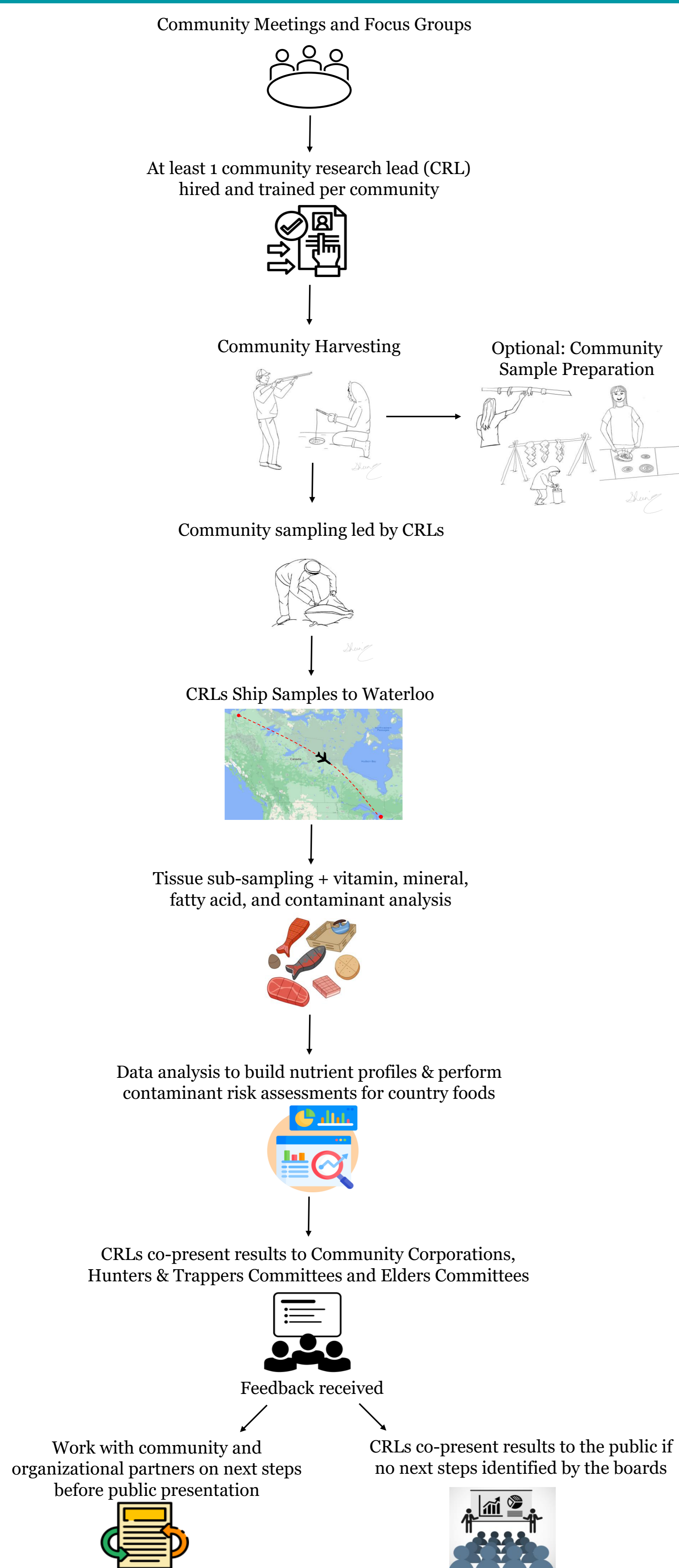3. Engage Indigenous Knowledge Holders throughout all project stages

Methods

Community Meetings and Focus Groups

At least 1 community research lead (CRL) hired and trained per community

Community Harvesting

Optional: Community Sample Preparation

Community sampling led by CRLs

CRLs Ship Samples to Waterloo

Tissue sub-sampling + vitamin, mineral, fatty acid, and contaminant analysis

Data analysis to build nutrient profiles & perform contaminant risk assessments for country foods

CRLs co-present results to Community Corporations, Hunters & Trappers Committees and Elders Committees

Feedback received

Work with community and organizational partners on next steps before public presentation

CRLs co-present results to the public if no next steps identified by the boards

Figure 1. Methods used to sample and analyze country foods and disseminate results in all 6 communities across the ISR.

Results

Nutrient Assessment of Country Foods Collected Across the ISR

Table 1. Classification of nutrients in prepared muscle in country foods in the ISR using Health Canada's Daily Value Guidelines

	Se	Fe	Zn	Vit D	N-3 PUFAs
Aquatic Mammals	E	E	G	G	E
Bears	E	E	E	C	E
Ducks	E	E	C	G	E
Fish	E	C	C	E	E
Goose	E	E	G	C	E
Other Birds	E	E	G	C	E
Seal	E	E	G	C	E
Terrestrial Mammals	E	E	E	G	E
Beluga	E	E	E	E	E

E = Excellent Source (>25% Daily Value)
G = Good Source (> 15% Daily Value)
C = Source Contains (>5% Daily Value)

Table 2. Classification of nutrients in raw organs in country foods in the ISR using Health Canada's Daily Value Guidelines

	Co	Se	Fe	Vit A	Vit D	N-3 PUFAs
Aquatic Mammals	E	C	C	E	E	ND
Ducks	E	C	C	E	ND	ND
Fish	E	C	G	E	E	E
Goose	E	C	E	E	ND	E
Other Birds	E	N	G	N	C	E
Seal	E	N	E	ND	E	ND
Terrestrial Mammals	E	C	G	N	G	C
Beluga (Maqtaaq)	E	E	E	N	ND	ND

E = Excellent Source (>25% Daily Value)
G = Good Source (> 15% Daily Value)
C = Source Contains (>5% Daily Value)
N = Not a Source
ND = No Data

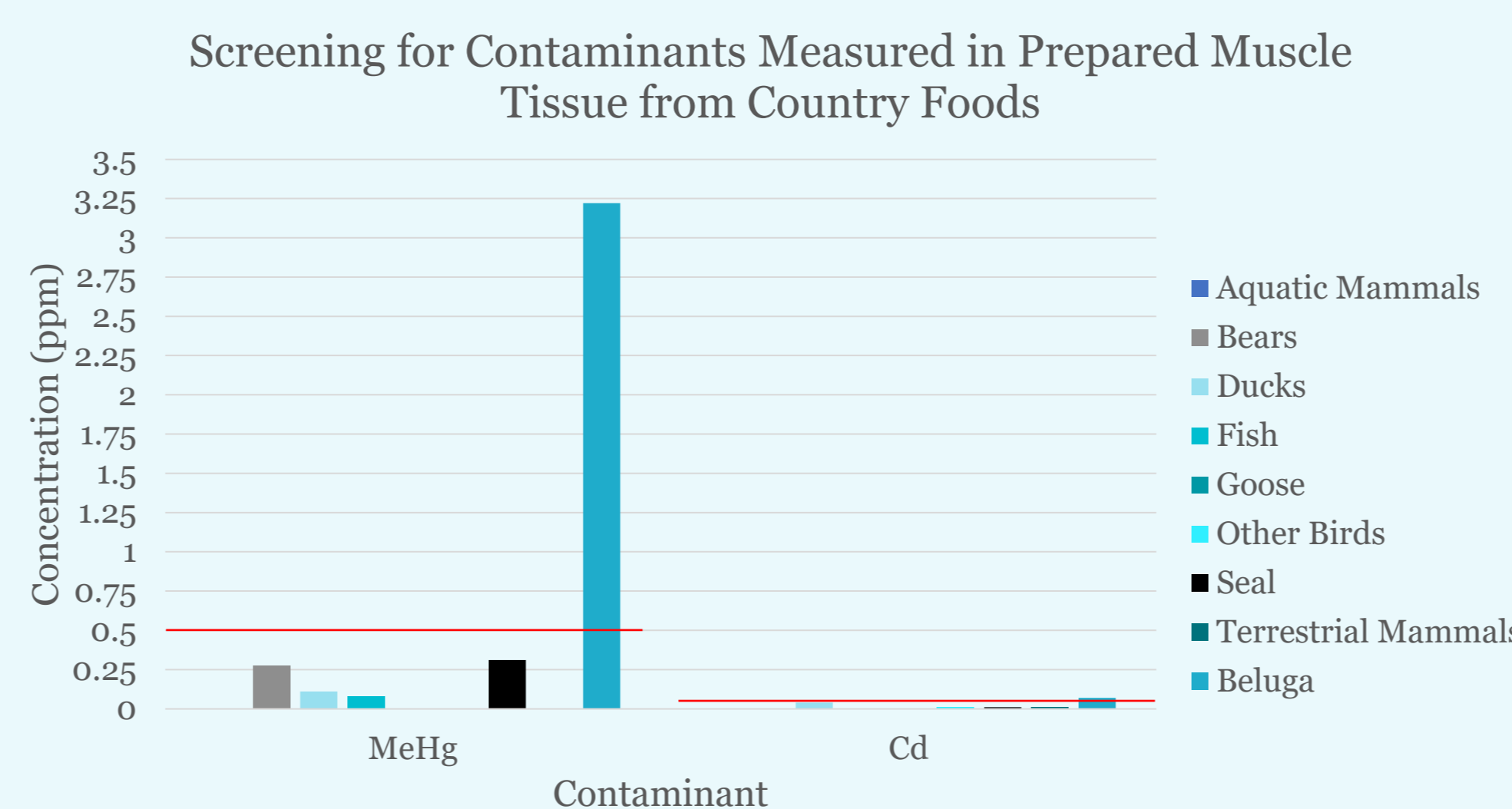### Contaminant Assessment of Country Foods Collected in the ISR

Screening for Contaminants Measured in Prepared Muscle Tissue from Country Foods

Legend: Aquatic Mammals, Bears, Ducks, Fish, Goose, Other Birds, Seal, Terrestrial Mammals, Beluga

Figure 2. Contaminants measured in prepared muscle tissue from different groupings of country foods across the ISR compared to their respective maximum limit (ML) screening values. If contaminant concentration exceeded ML screening value, risk assessment was performed. Lead was not included above as most samples analyzed were at or below method detection limit.
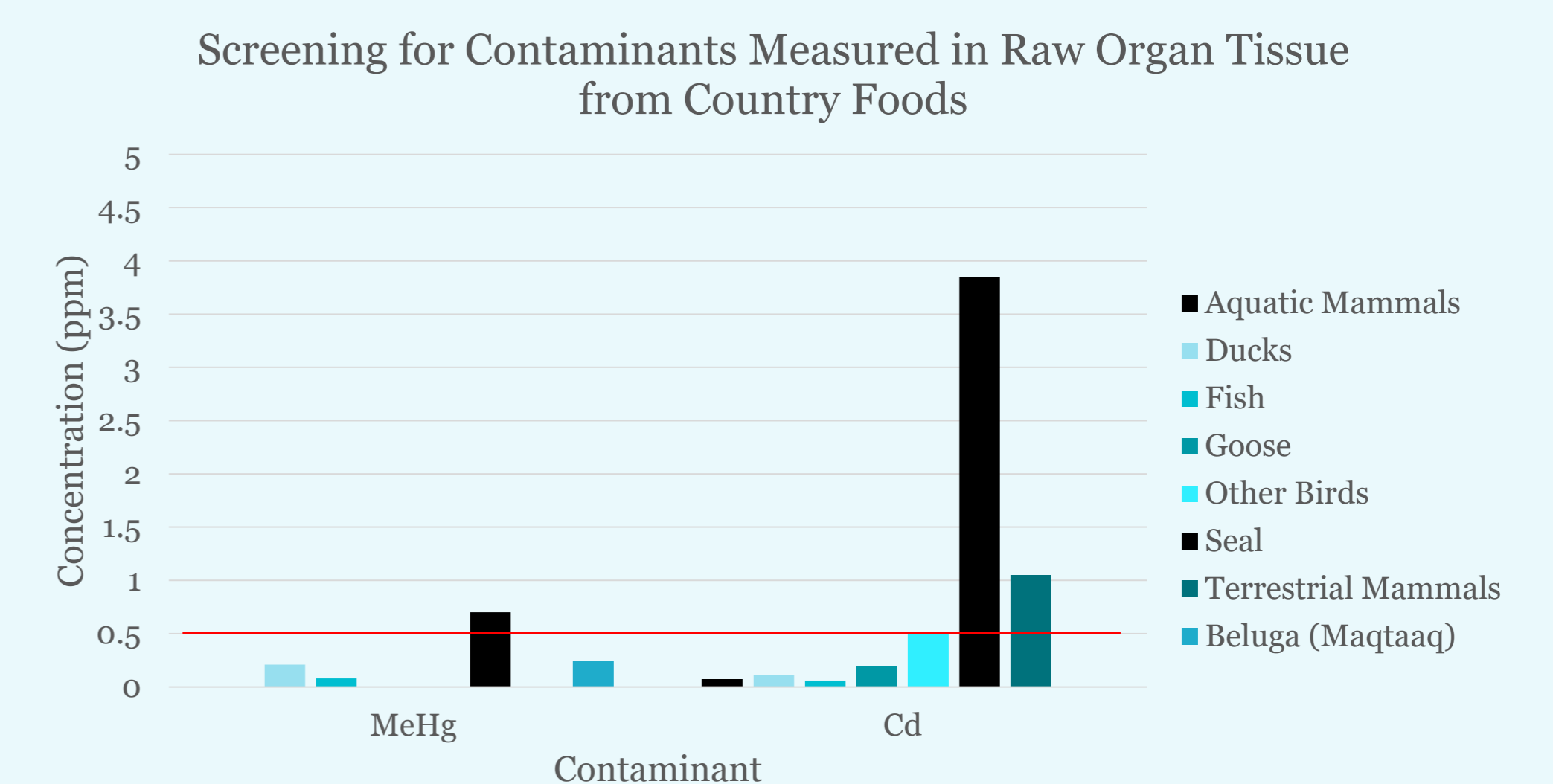

Screening for Contaminants Measured in Raw Organ Tissue from Country Foods

Legend: Aquatic Mammals, Ducks, Fish, Goose, Other Birds, Seal, Terrestrial Mammals, Beluga (Maqtaaq)

Figure 3. Contaminants measured in raw organ tissue from different groupings of country foods across the ISR compared to their respective maximum limit (ML) screening values. If contaminant concentration exceeded ML screening value, risk assessment was performed. Lead was not included above as most samples analyzed were at or below method detection limit.

Table 3. Adult lifetime risk assessment performed for animal types and tissues

Animal Type	Tissue	Prep Method	Contaminant	Adult Population	Average Consumers Intake (µg/kg-d)	Average Consumers HQ	High Consumers Intake (µg/kg-d)	High Consumers HQ
Beluga	Muscle	Dried	MeHg	Sensitive	0.123	0.61	0.172	0.86
			MeHg	General	0.123	0.26	0.172	0.37
			Cd	General	0.003	0.00	0.004	0.00
Seal	Organs	Raw	MeHg	Sensitive	0.018	0.09	0.040	0.20
			MeHg	General	0.018	0.00	0.040	0.00
			Cd	General	0.096	0.12	0.222	0.28
Terrestrial Mammals	Organs	Raw	Cd	General	0.022	0.03	0.031	0.04

HQ <0.3 was considered to pose very low risk to human health; HQ < 1.0 was considered to pose low risk to human heath

Conclusion

• On-going collaboration with local, regional, territorial and national partners is essential for project success.

• Country foods are good and excellent sources of micronutrients, including minerals, vitamins, and polyunsaturated fatty acids.

• Risk assessments indicate that heavy metals present in country foods pose a low (HQ < 1.0) and very low (HQ <0.3) risk to adult human health in the ISR.

• Risk assessments could not be performed for many organs or for children due to lack of dietary intake information.

• Co-interpretation of the results to the community organizations highlighted inter-community variation in concerns and preferences. Feedback will help support the co-development of dietary health messages for the ISR, highlight additional data gaps, and identify community-specific priorities for next steps.
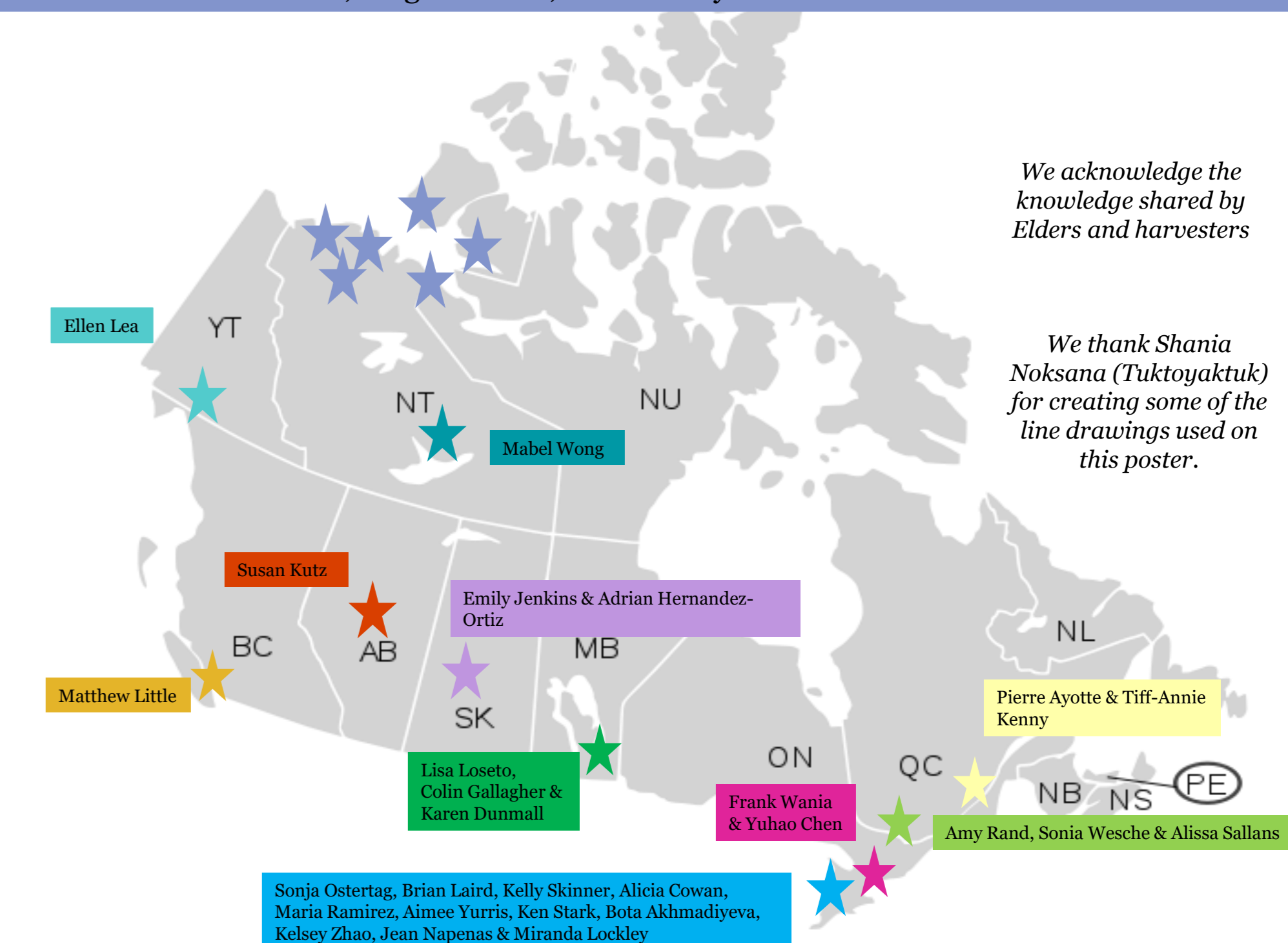
Acknowledgements

Our Team

Our Funders